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Attorney's Docket No.: 21121-002001 / 2301
Cof C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Hubert Köster et al.
Serial No. : 09/067,337
Filed : April 27, 1998
Patent No. : 7,094,943
Issue Date : August 22, 2006
Title : SOLUTION PHASE BIOPOLYMER SYNTHESIS

Art Unit : 1624
Examiner : Paul V. Ward

Attn: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

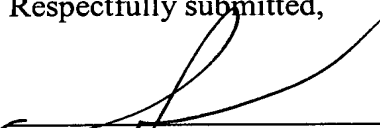
TRANSMITTAL LETTER

Dear Sir:

Transmitted herewith are a Request for a Certificate of Correction pursuant to C.F.R. § 1.322 & § 1.323 (7 pages), Certificate of Correction Form PTO-1050 (7 pages), a copy of a Preliminary Amendment, filed on December 6, 2005, a copy of an Examiner's Amendment to the record, issued February 8, 2006, and a return postcard for filing in connection with the above-identified application. One or more of the errors sought to be corrected were made by applicant, and a check for \$100 is enclosed to cover the required fee of 37 CFR §1.20(a).

☒ The Commissioner is hereby authorized to charge any fees that may be due in connection with this paper or with this application during its entire pendency to Deposit Account No. 06-1050. A duplicate of this sheet is enclosed.

Respectfully submitted,


Stephanie Seidman
Reg. No. 33,779

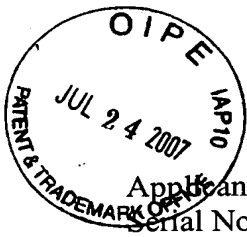
Attorney Docket No. 21121-002001 / 2301
Address all correspondence to:
Stephanie Seidman
Fish & Richardson P.C.
12390 El Camino Real
San Diego, California 92130
Telephone: (858) 678-4777
Facsimile: (202) 626-7796
email: seidman@fr.com

Certificate
JUL 30 2007
of Correction

CERTIFICATE OF MAILING BY "EXPRESS MAIL"
"Express Mail" Mailing Label Number EV 965983475 US
Date of Deposit July 24, 2007
I hereby certify that this paper is being deposited with the United States Postal "Express Mail Post Office to Addressee" Service under 37 CFR §1.10 on the date indicated above and is addressed to: Commissioner for Patents, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA, 22313-1450.

Stephanie Seidman

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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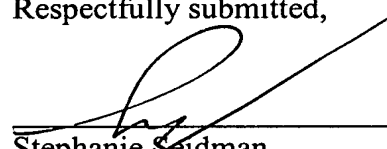
TRANSMITTAL LETTER

Dear Sir:

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☒ The Commissioner is hereby authorized to charge any fees that may be due in connection with this paper or with this application during its entire pendency to Deposit Account No. 06-1050. A duplicate of this sheet is enclosed.

Respectfully submitted,


Stephanie Seidman
Reg. No. 33,779

Attorney Docket No. 21121-002001 / 2301

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San Diego, California 92130

Telephone: (858) 678-4777

Facsimile: (202) 626-7796


email: seidman@fr.com

CERTIFICATE OF MAILING BY "EXPRESS MAIL"

"Express Mail" Mailing Label Number **EV 965983475 US**

Date of Deposit **July 24, 2007**

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Stephanie Seidman

AUG 1 2007



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Hubert Köster et al.

Art Unit : 1624

Serial No. : 09/067,337

Examiner : Paul V. Ward

Filed : April 27, 1998

Patent No. : 7,094,943

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Attn.: Certificate of Corrections Branch

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

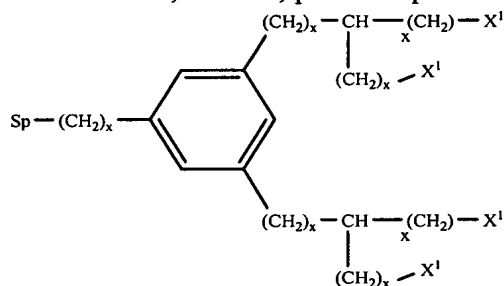
REQUEST FOR CERTIFICATE OF CORRECTION

Dear Sir:

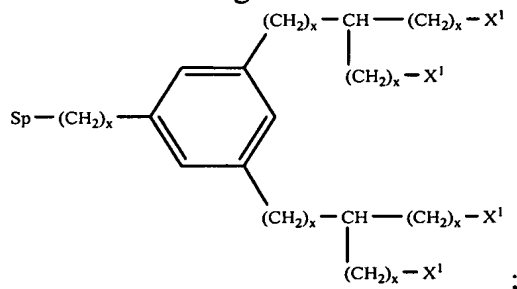
Pursuant to 37 C.F.R. § 1.322 and 1.323, the patentee respectfully requests that a Certificate of Correction be issued for the above referenced patent to correct the following errors:

IN THE SPECIFICATION:

At column 3, line 60, please replace structure



with the following structure



at column 4, line 25, please replace structure

07/26/2007 MBLANDU 00000313 7094943

61 FC:1811

100.00 3P

CERTIFICATE OF MAILING BY "EXPRESS MAIL"

"Express Mail" Mailing Label Number **EV 965983475 US**

Date of Deposit **July 24, 2007**

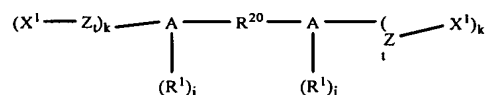
I hereby certify that this paper is being deposited with the United States Postal "Express Mail Post Office to Addressee" Service under 37 CFR §1.10 on the date indicated above and is addressed to: Commissioner for Patents, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA, 22313-1450.

Stephanie Seidman

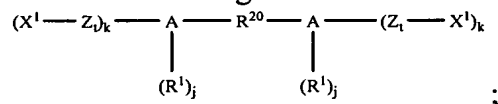
AUG 1 2007

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 Patent No. : 7,094,943
 Issued : August 22, 2006
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Request for Certificate of Correction



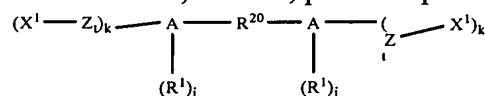
with the following structure



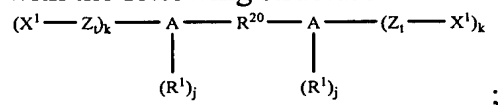
at column 11, line 40, please replace

“-Sp-O-C₆H₄(C₆H₅)₂C-OH (-->-Sp-O-C₆H₄(C₆H₅)₂C-Cl” with
 - -Sp-O-C₆H₄(C₆H₅)₂C-OH-->-Sp-O-C₆H₄(C₆H₅)₂C-Cl - ;

at column 18, line 45, please replace structure



with the following structure



at column 23, line 45, please replace

“(3'-p-nitrophenylsuccinoyl-5'-DMT-dT)
 pyridine
 R-4,4'-dimethoxytrityl” with

-(3'-p-nitrophenylsuccinoyl-5'-DMT-dT)
 $\xrightarrow{\text{pyridine}}$
 R=4,4'-dimethoxytrityl-;

at column 26, line 17, please replace

“R-4,4'-dimethoxytrityl” with -R=4,4'-dimethoxytrityl-;

at column 26, last line, please replace

“R-4,4'-dimethoxytrityl” with -R=4,4'-dimethoxytrityl-; and

at column 31, in Table 1, line 32, please replace

“d(GACGGCCAGT)” with -d(GACGGCCAGT) (SEQ ID No. 1)-.

IN THE CLAIMS:

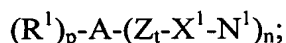
Please replace Claims 5, 11 and 17 with the following Claims:

AUG 1 2007

5. The LPC of claim 1, wherein Z is any combination of 1-12 units selected from 1,4-phenylene and methylene, which units may be combined in any order, with the proviso that if Z is methylene, then Z contains more than three methylene units.

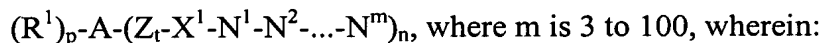
11. A method of solution phase biopolymer synthesis, comprising the steps of:

- (a) reacting an LPC of formula $(R^1)_p-A-(Z_t-X^1)_n$ with a first monomer N^1 ;
(b) separating and purifying the product of step (a) to afford a compound of formula



- (c) reacting the product of step (b) with a second monomer N^2 , a dimer N^2-N^3 or a trimer $N^2-N^3-N^4$; and

- (d) repeating steps (b) and (c) to produce an LPC-bound biopolymer of formula



A is silicon; R^1 is hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclalkyl; p is 0 or 1;

Z is any combination of 0-12 units selected from 1,2-, 1,3- or 1,4-phenylene and alkylene, which units may be combined in any order; t is 0 or 1;

X^1 is a reactive group that effects the biosynthesis of biopolymers from monomers to produce biopolymers selected from the group consisting of polypeptides, oligonucleotides, peptide nucleic acids and oligosaccharides;

n is 3 or 4, with the proviso that if Z is methylene, then Z contains more than three methylene units;

R^1 , X^1 , and Z are unsubstituted or substituted with one or more substituents each independently selected from Q;

Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, polyhaloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aryloxy, aryloxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy, aryl-alkoxy, amino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl,

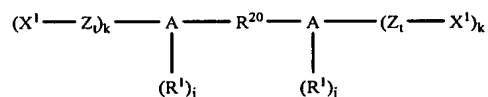
AUG 1 2006

AUG 1 2007 AUG 1 2007

diarylaminomethyl, alkylamino, dialkylamino, arylamino, diarylamino, alkylarylamino, alkylcarbonylamino, alkoxycarbonylamino, arylcarbonylamino, aryloxycarbonylamino, azido, alkylthio, arylthio, perfluoroalkylthio, thiocyno, isothiocyno, alkylsulfinyl, alkylsulfonyl, arylsulfinyl, arylsulfonyl, aminosulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, arylaminosulfonyl or diarylaminosulfonyl;

$N^1, N^2, N^3 \dots N^m$ are biopolymer monomers; and
the dimers and trimers comprise the monomers.

17. A liquid phase carrier (LPC) that has formula:



wherein:

A is silicon; R^1 is hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclalkyl;

Z is any combination of 1-12 units selected from 1,2-, 1,3- or 1,4-phenylene and alkylene, which units may be combined in any order; t is 0 or 1;

X^1 is a reactive group that effects the biosynthesis of biopolymers from monomers to produce biopolymers are selected from the group consisting of polypeptides, oligonucleotides, peptide nucleic acids and oligosaccharides;

R^1, X^1 , and Z are unsubstituted or substituted with one or more substituents each independently selected from Q;

Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, polyhaloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aryloxycarbonyl, aryloxycarbonylalkyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, arylaminocarbonyl, diarylaminocarbonyl, arylalkylaminocarbonyl, alkoxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy, arylalkoxy, amino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylamino, dialkylamino, arylamino,

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Request for Certificate of Correction

diaryl-amino, alkylaryl-amino, alkylcarbonyl-amino, alkoxy-carbonyl-amino, arylcarbonyl-amino, aryloxy-carbonyl-amino, azido, alkylthio, arylthio, perfluoroalkylthio, thiocyno, isothiocyano, alkylsulfinyl, alkylsulfonyl, arylsulfinyl, arylsulfonyl, aminosulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, arylaminosulfonyl or diarylaminosulfonyl;

R²⁰ is alkylene, alkenylene, alkynylene, arylene or heteroarylene;

k is 2 or 3; and

j is 0 or 1.

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Request for Certificate of Correction

REMARKS

Amendments to the Specification

A Certificate of Correction (Form PTO-1050) incorporating the above changes is included with this Request. Since not all the errors are those of the Patent Office, a check is enclosed to cover the required fee. If it is determined that the fee amount is incorrect or if the check is missing, the Office is hereby authorized to charge the fee to Deposit Account No. 06-1050.

This Certificate of Correction seeks to correct obvious typographical and grammatical errors in the Specification. The amendment to the structure at column 3, lines 60-65 corrects a typographical error introduced by the PTO in the chemical bonds and in the location of the "x" for the methylene subunits " $(CH_2)_x$ ". This amendment finds basis on page 5, line 1 of the originally filed application, where the structure is correctly presented. The amendment to the structures at column 4, line 25, and column 18, line 45 corrects a typographical error introduced by the PTO in the group " Z_i " and in the chemical bonds. These amendments find basis at page 6, line 1, and page 30, line 1 of the originally filed specification, where the structures are correctly presented. The correction to column 11, line 40 corrects a typographical error in a formula.

The amendment at column 23, line 45, inserts an arrow to clarify the illustrated synthetic scheme and corrects a typographical error in " $R=4,4'$ -dimethoxytrityl". Basis for this amendment can be found, for example, at page 38, lines 30-40 of the specification as originally filed, and at page 43, lines 10-20, where the arrow is drawn for another reaction with the reagent 3'-p-nitrophenylsuccinoyl-5'-DMT-dT. The amendments at column 26, line 17 and last line also correct a typographical error in " $R=4,4'$ -dimethoxytrityl". The amendment at column 31, Table 1 inserts the SEQ ID label for SEQ ID No. 1. Basis for this amendment can be found in SEQ ID No. 1 in the sequence listing.

Amendments to the Claims

Claim 5 is amended to correct an error introduced by the PTO at column 43, line 15 by inserting "in any" between "combined" and "order". The basis for this amendment is found on page 3, line 10 of the Preliminary Amendment with Request for Continued Examination, filed on December 6, 2005, a copy of which is herewith attached as evidence. Claims 11 and 17 are amended to correct errors introduced by the PTO at column 43, line 43,

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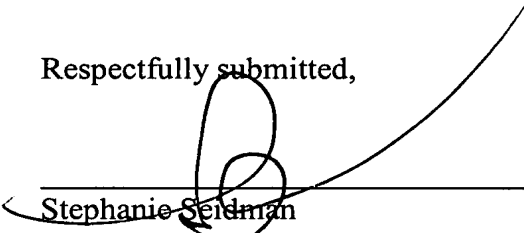
Applicant : Köster et al.
Patent No. : 7,094,943
Issued : August 22, 2006
Serial No. : 09/067,337
Filed : April 27, 1998

Attorney's Docket No.: 21121-002001 / 2301
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and column 44, line 34 by inserting "X¹" before "is a reactive group that effects". Basis for this amendment is found on page 2, lines 13 and 17 of the Examiner's Amendment to the record in the Notice of Allowance, issued February 8, 2006, a copy of which is herewith attached as evidence.

Accordingly, none of the requested changes constitute new matter. Patentee respectfully requests correction of errors by issuance of a Certificate of Correction.

Respectfully submitted,



Stephanie Seidman
Reg. No. 33,779

Attorney Docket No. 21121-002001 / 2301
Address all correspondence to:
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12390 El Camino Real
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Facsimile: (202) 626-7796
email: seidman@fr.com
10752487.doc

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UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

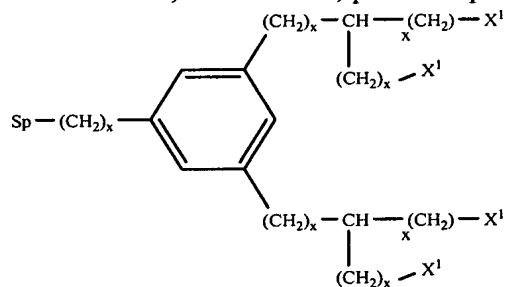
Page 1 of 7

PATENT NO. : 7,094,943
APPLICATION NO : 09/067,337
DATED : JULY 10, 2007
INVENTOR(S) : HUBERT KÖSTER ET AL.

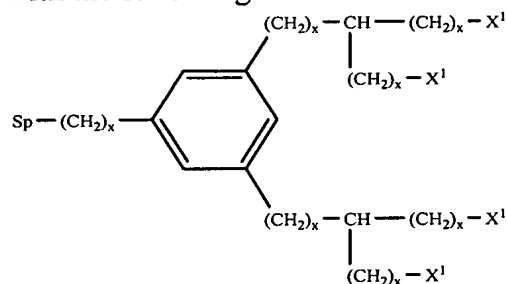
It is certified that an error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE SPECIFICATION:

At column 3, lines 60-65, please replace structure



with the following structure



MAILING ADDRESS OF SENDER:

PATENT No. 7,094,943

Stephanie Seidman
Fish & Richardson P.C.
12390 El Camino Real
San Diego, California 92130

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Page 2 of 7

PATENT NO. .: 7,094,943

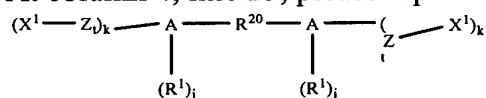
APPLICATION NO .: 09/067,337

DATED .: JULY 10, 2007

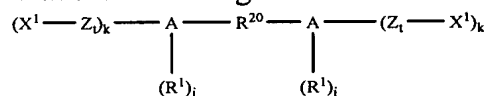
INVENTOR(S) .: HUBERT KÖSTER ET AL.

It is certified that an error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

At column 4, line 25, please replace structure



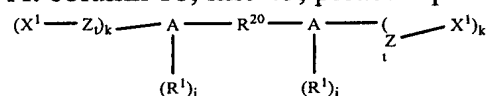
with the following structure



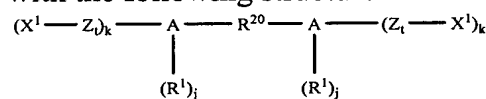
At column 11, line 40, please replace

“-Sp-O-C₆H₄(C₆H₅)₂C-OH (-->-Sp-O-C₆H₄(C₆H₅)₂C-Cl” with
 - -Sp-O-C₆H₄(C₆H₅)₂C-OH-->-Sp-O-C₆H₄(C₆H₅)₂C-Cl -

At column 18, line 45, please replace structure



with the following structure



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 San Diego, California 92130

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Only**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**Page 3 of 7

PATENT NO. .: 7,094,943
APPLICATION NO .: 09/067,337
DATED .: JULY 10, 2007
INVENTOR(S) .: HUBERT KÖSTER ET AL.

It is certified that an error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

At column 23, line 45, please replace
“(3'-p-nitrophenylsuccinoyl-5'-DMT-dT)
pyridine
R-4,4'-dimethoxytrityl” with

—(3'-p-nitrophenylsuccinoyl-5'-DMT-dT)

—————→
pyridine
R=4,4'-dimethoxytrityl—

At column 26, line 17, please replace
“R-4,4'-dimethoxytrityl” with —R=4,4'-dimethoxytrityl—

At column 26, last line, please replace
“R-4,4'-dimethoxytrityl” with —R=4,4'-dimethoxytrityl—

At column 31, line 32, in Table 1 please replace
“d(GACGGCCAGT)” with —d(GACGGCCAGT) (SEQ ID No. 1)—

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CERTIFICATE OF CORRECTION

Page 4 of 7

PATENT NO. .: 7,094,943
 APPLICATION NO .: 09/067,337
 DATED .: JULY 10, 2007
 INVENTOR(S) .: HUBERT KÖSTER ET AL.

It is certified that an error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE CLAIMS:

Please replace Claims 5, 11 and 17 with the following Claims:

5. The LPC of claim 1, wherein Z is any combination of 1-12 units selected from 1,4-phenylene and methylene, which units may be combined in any order, with the proviso that if Z is methylene, then Z contains more than three methylene units.

11. A method of solution phase biopolymer synthesis, comprising the steps of:

- (a) reacting an LPC of formula $(R^1)_p-A-(Z_t-X^1)_n$ with a first monomer N^1 ;
- (b) separating and purifying the product of step (a) to afford a compound of formula $(R^1)_p-A-(Z_t-X^1-N^1)_n$;
- (c) reacting the product of step (b) with a second monomer N^2 , a dimer N^2-N^3 or a trimer $N^2-N^3-N^4$; and
- (d) repeating steps (b) and (c) to produce an LPC-bound biopolymer of formula $(R^1)_p-A-(Z_t-X^1-N^1-N^2-...-N^m)_n$, where m is 3 to 100, wherein:

A is silicon; R^1 is hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclylalkyl; p is 0 or 1;

Z is any combination of 0-12 units selected from 1,2-, 1,3- or 1,4-phenylene and alkylene, which units may be combined in any order; t is 0 or 1;

X^1 is a reactive group that effects the biosynthesis of biopolymers from monomers to produce biopolymers selected from the group consisting of polypeptides, oligonucleotides, peptide nucleic acids and oligosaccharides;

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313 1 2007

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

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INVENTOR(S) : HUBERT KÖSTER ET AL.

n is 3 or 4, with the proviso that if Z is methylene, then Z contains more than three methylene units;

R¹, X¹, and Z are unsubstituted or substituted with one or more substituents each independently selected from Q;

Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, polyhaloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aryloxycarbonyl, aryloxycarbonylalkyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, arylaminocarbonyl, diarylaminocarbonyl, arylalkylaminocarbonyl, alkoxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy, arylalkoxy, amino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylamino, dialkylamino, arylamino, diarylamino, alkylaryl amino, alkylcarbonylamino, alkoxycarbonylamino, arylcarbonylamino, aryloxycarbonylamino, azido, alkylthio, arylthio, perfluoroalkylthio, thiocyano, isothiocyano, alkylsulfinyl, alkylsulfonyl, arylsulfinyl, arylsulfonyl, aminosulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, arylaminosulfonyl or diarylaminosulfonyl;

N¹, N², N³...N^m are biopolymer monomers; and the dimers and trimers comprise the monomers.

PATENT NO. 7,094,943

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UNITED STATES PATENT AND TRADEMARK OFFICE

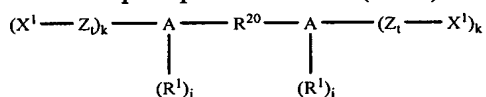
CERTIFICATE OF CORRECTION

Page 6 of 7

PATENT NO. .: 7,094,943
 APPLICATION NO .: 09/067,337
 DATED .: JULY 10, 2007
 INVENTOR(S) .: HUBERT KÖSTER ET AL.

It is certified that an error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

17. A liquid phase carrier (LPC) that has formula:



wherein:

- A is silicon; R¹ is hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclalkyl;
- Z is any combination of 1-12 units selected from 1,2-, 1,3- or 1,4-phenylene and alkylene, which units may be combined in any order; t is 0 or 1;
- X¹ is a reactive group that effects the biosynthesis of biopolymers from monomers to produce biopolymers are selected from the group consisting of polypeptides, oligonucleotides, peptide nucleic acids and oligosaccharides;
- R¹, X¹, and Z are unsubstituted or substituted with one or more substituents each independently selected from Q;
- Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, poly-haloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aryloxycarbonyl, aryloxycarbonylalkyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, arylaminocarbonyl, diarylaminocarbonyl, arylalkylaminocarbonyl, alkoxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy, arylalkoxy, amino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylamino, dialkylamino, arylamino,

MAILING ADDRESS OF SENDER:

PATENT NO. 7,094,943

Stephanie Seidman
 Fish & Richardson P.C.
 12390 El Camino Real
 San Diego, California 92130

AUG 1 2007

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UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 7 of 7

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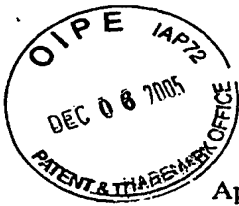
diaryl-amino, alkylaryl-amino, alkylcarbonylamino, alkoxycarbonylamino, arylcarbonyl-
amino, aryloxycarbonylamino, azido, alkylthio, arylthio, perfluoroalkylthio, thiocyano,
isothiocyano, alkylsulfinyl, alkylsulfonyl, arylsulfinyl, arylsulfonyl, aminosulfonyl,
alkylaminosulfonyl, dialkylaminosulfonyl, arylaminosulfonyl or diarylamino-sulfonyl;
 R^{20} is alkylene, alkenylene, alkynylene, arylene or heteroarylene;
k is 2 or 3; and
j is 0 or 1.

MAILING ADDRESS OF SENDER:

PATENT No. 7,094,943

Stephanie Seidman
Fish & Richardson P.C.
12390 El Camino Real
San Diego, California 92130

AUG 1 2007



Attorney's Docket No.: 17111-002001/2301

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Hubert Köster et al.
Serial No. : 09/067,337
Filed : April 27, 1998
Conf. No. : 9981
Title : SOLUTION PHASE BIOPOLYMER SYNTHESIS

Art Unit : 1623
Examiner : Paul V. Ward
Cust. No. : 20985

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Dear Sir:

This Preliminary Amendment is filed with a Request for Continued Examination (RCE) and is responsive to the Office Action, mailed June 6, 2005. Entry of the following amendments and remarks are respectfully requested.

Amendments to the claims are reflected in the listing of the claims which begin on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

- 1 -

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I hereby certify that this paper is being deposited with the United States Postal "Express Mail Post Office to Addressee" Service under 37 CFR §1.10 on the date indicated above and is addressed to: Commissioner for Patents, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA, 22313-1450.

Stephanie L. Seidman

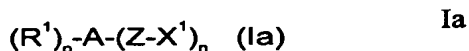
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Amendments to the Claims:

Please amend claims 5, 33 and 45 as follows: This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. - 4. Cancelled.
5. (Currently amended) A liquid phase carrier (LPC) that has formula (Ia):



wherein:

A is silicon; R¹ is hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclalkyl; p is 0 or 1;

Z is any combination of 1-12 units selected from 1,2-, 1,3- or 1,4-phenylene and alkylene units, which units may be combined in any order, with the proviso that if Z is methylene, then Z contains more than three methylene units;

X¹ is ~~a~~ any reactive group that effects the biosynthesis of biopolymers from monomers to produce biopolymers selected from among polypeptides, oligonucleotides, peptide nucleic acids and oligosaccharides;

n is 3 or 4; ~~with the proviso that if Z is methylene, then Z contains more than three methylene units;~~

R¹, X¹, and Z are unsubstituted or substituted with one or more substituents each independently selected from Q; and

Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, polyhaloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aryloxycarbonyl, aryloxycarbonylalkyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, arylaminocarbonyl, diarylaminocarbonyl, arylalkylaminocarbonyl, alkoxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy, aryl-alkoxy, amino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylamino, dialkylamino, arylamino, diarylamino, alkylaryl amino, alkylcarbonylamino, alkoxycarbonylamino, arylcarbonylamino, aryloxycarbonylamino, azido, alkylthio, arylthio, perfluoroalkylthio, thiocyno, isothiocyano, alkylsulfinyl, alkylsulfonyl, arylsulfinyl,

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arylsulfonyl, aminosulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, arylaminosulfonyl or diarylamino sulfonyl.

6. (Previously presented) The LPC of claim 5, wherein: X^1 is OH, SH, NH_2 , COR^5 or $COOR^4$, where R^4 is selected from hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl and heterocyclalkyl; and R^5 is halide, heteroaryl or pseudohalide.

7. (Previously presented) The LPC of claim 5, wherein Z is a group with three or more points of attachment: one to A, and the others to two or more X^1 groups.

11. (Previously presented) The LPC of claim 5, wherein p is 0 and n is 4.

12. (Previously presented)) The LPC of claim 5, wherein Z is any combination of 1-12 units selected from 1,4-phenylene and methylene, which units may be combined in any order, with the proviso that if Z is methylene, then Z contains more than three methylene units.

13. (Previously presented) The LPC of claim 5, wherein Z is C_{1-12} alkylene, with the proviso that if Z is methylene, then Z contains more than three methylene units.

14. (Previously presented) The LPC of claim 5, wherein X^1 is OH, SH or NH_2 .

15. (Previously presented) The LPC of claim 14, wherein X^1 is OH.

16. (Previously presented) The LPC of claim 14, wherein X^1 is NH_2 .

17-28. Cancelled.

29. (Previously presented) The LPC of claim 5 that is coupled to a photocleavable linker.

30-32. Cancelled.

33. (Currently amended) A method of solution phase biopolymer synthesis, comprising the steps of:

(a) reacting an LPC of formula $(R^1)_p-A-(Z_t-X^1)_n$ with a first monomer N^1 ;

(b) separating and purifying the product of step (a) to afford a compound of formula $(R^1)_p-A-(Z_t-X^1-N^1)_n$;

(c) reacting the product of step (b) with a second monomer N^2 , a dimer N^2-N^3 or a trimer $N^2-N^3-N^4$; and

(d) repeating steps (b) and (c) to produce an LPC-bound biopolymer of formula $(R^1)_p-A-(Z_t-X^1-N^1-N^2-...-N^m)_n$, where m is 3 to 100, wherein:

A is silicon; R^1 is hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclalkyl; p is 0 or 1;

Z is any combination of 0-12 units selected from 1,2-, 1,3- or 1,4-phenylene and alkylene, which units may be combined in any order; t is 0 or 1; X^1 is any reactive group that

effects biosynthesis of biopolymers from monomers to produce biopolymers selected from among polypeptides, oligonucleotides, peptide nucleic acids and oligosaccharides; n is 3 or 4, ; with the proviso that if Z is methylene, then Z contains more than three methylene units;

R^1 , X^1 , and Z are unsubstituted or substituted with one or more substituents each independently selected from Q; ~~and~~

Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, polyhaloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aryloxycarbonyl, aryloxycarbonylalkyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, arylaminocarbonyl, diarylaminocarbonyl, arylalkylaminocarbonyl, alkoxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy, aryl-alkoxy, amino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylamino, dialkylamino, arylamino, diarylamino, alkylaryl amino, alkylcarbonylamino, alkoxycarbonylamino, arylcarbonylamino, aryloxycarbonylamino, azido, alkylthio, arylthio, perfluoroalkylthio, thiocyano, isothiocyano, alkylsulfinyl, alkylsulfonyl, arylsulfinyl, arylsulfonyl, aminosulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, arylaminosulfonyl or diarylaminosulfonyl; ~~and~~

N^1 , N^2 , $N^3 \dots N^m$ are biopolymer monomers; and
the dimers and trimers comprise the monomers.

34. (Previously presented) The method of claim 33, wherein the biopolymer is an oligonucleotide, peptide, peptide nucleic acid (PNA) or oligosaccharide.

35. (Previously presented) The method of claim 33, further comprising the step of:
(e) cleaving the biopolymer from the LPC.

36. (Previously presented) The method of claim 33, wherein the biopolymer is an oligonucleotide.

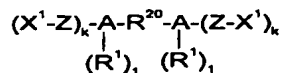
37. (Previously presented) The method of claim 33, wherein n is 3 or 4.

38. Cancelled.

39. (Previously presented) The method of claim 33, wherein X^1 is OH, SH, NH_2 , COR^5 or $COOR^4$, where R^4 is selected from hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl and heterocyclylalkyl; and R^5 is halide, heteroaryl or pseudohalide.

40-44. Cancelled.

45. (Currently amended) A liquid phase carrier (LPC) that has formula:



wherein:

A is silicon; R¹ is hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclalkyl;

Z is any combination of 1-12 units selected from 1,2-, 1,3- or 1,4-phenylene and alkylene, which units may be combined in any order; t is 0 or 1;

X¹ is any reactive group that effects biosynthesis of biopolymers from monomers to produce biopolymers are selected from among polypeptides, oligonucleotides, peptide nucleic acids and oligosaccharides;

R¹, X¹, and Z are unsubstituted or substituted with one or more substituents each independently selected from Q; ~~and~~

Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, polyhaloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxy-carbonyl, alkoxycarbonylalkyl, aryloxy-carbonyl, aryloxy-carbonylalkyl, aminocarbonyl, alkyl-aminocarbonyl, dialkylaminocarbonyl, arylaminocarbonyl, diarylaminocarbonyl, arylalkyl-aminocarbonyl, alkoxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy, arylalkoxy, amino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylamino, dialkylamino, arylamino, diarylamino, alkylaryl-amino, alkylcarbonylamino, alkoxycarbonylamino, arylcarbonylamino, aryloxy-carbonylamino, azido, alkylthio, arylthio, perfluoroalkylthio, thiocyano, isothiocyano, alkylsulfinyl, alkylsulfonyl, arylsulfinyl, arylsulfonyl, aminosulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, arylaminosulfonyl or diarylaminosulfonyl;

R²⁰ is alkylene, alkenylene, alkynylene, arylene or heteroarylene;

k is 2 or 3; and

j is 0 or 1.

49. (Previously presented) The LPC of claim 5 coupled to a biopolymer.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Stephanie Seidman on February 3, 2006.

AMENDMENTS TO THE CLAIMS

In Claim 5, X¹ has been rewritten—X¹ is a reactive group that effects the biosynthesis of biopolymers from monomers to produce biopolymers selected from the group consisting of polypeptides, oligonucleotides, peptide nucleic acids and oligosaccharides;--.—

In Claim 33, X¹ has been rewritten – X¹ is a reactive group that effects the biosynthesis of biopolymers from monomers to produce biopolymers selected from the group consisting of polypeptides, oligonucleotides, peptide nucleic acids and oligosaccharides;--.—

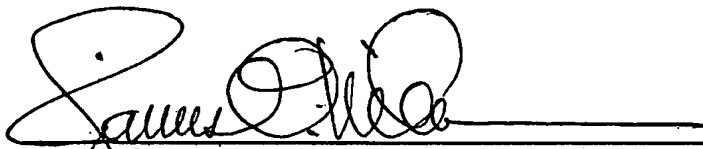
In Claim 45, X¹ has been rewritten – X¹ is a reactive group that effects the biosynthesis of biopolymers from monomers to produce biopolymers selected from the group consisting of polypeptides, oligonucleotides, peptide nucleic acids and oligosaccharides;--.—

AUG 1 2007

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL V. WARD whose telephone number is 571-272-2909. The examiner can normally be reached on M-F 8 am to 4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 571-272-0661. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


James O. Wilson
Supervisory Patent Examiner
Technology Center 1600

AUG 1 2007